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ORIGINAL ARTICLE

HIV Prevalence and High-Risk Subgroup Identification in Transgender Women Who Undergo Primary Vaginoplasty in the Netherlands

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Abstract

Purpose: Worldwide, transgender women (TGW) bear a high HIV burden. Limited data are available on HIV prevalence and risk factors among TGW in western European countries. Our aim is to assess the prevalence of TGW living with HIV who underwent primary vaginoplasty in an academic reference hospital and to identify high-risk subgroups.

Methods: All TGW who underwent primary vaginoplasty between January 2000 and September 2019 at our institution were identified. A retrospective chart study was conducted, recording the medical history, age at vaginoplasty, region of birth, use of medication, injecting drug use, history of pubertal suppression, HIV status, and sexual preference at time of surgical intake. High-risk subgroups were identified using logistic regression analysis.

Results: Between January 2000 and September 2019, a total of 950 TGW underwent primary vaginoplasty, of whom 31 (3.3%) individuals were known to live with HIV. Prevalence of HIV was higher in TGW born outside of Europe (20/145, 13.8%) than among those born in Europe (11/805, 1.4%), $p < 0.001$. In addition, having a sexual preference toward men was significantly associated with HIV. None of the TGW living with HIV had a history of puberty suppression.

Conclusion: The HIV prevalence in our study population is higher than the reported HIV prevalence in cisgender population in the Netherlands but lower than reported in previous studies in TGW. Further studies should investigate the need and feasibility of routine HIV testing of TGW in Western countries.

Keywords: gender reassignment surgery; HIV; sexual behavior; transgender persons

Introduction

Current literature shows that transgender women (TGW) are disproportionally affected by HIV.[1] Factors associated with living with HIV comprise engaging in sex work, condomless vaginal and/or anal intercourse with sex partners with an unknown HIV status, low socioeconomic status, substance use, and limited access to health care.[2,3] Worldwide, HIV prevalence in TGW is reported to range from 2% to 43%; data from western European countries are scarce.[1] The variation in reported prevalence may, partly, be explained by selection of study population, such as sex workers and geographical region. The reported combination of high burden of HIV and systemic disadvantages makes TGW an underserved and priority population for HIV testing, prevention, and treatment in these studies.[1]

In the Netherlands, care for transgender persons is concentrated in few centers, of which the Center of Expertise on Gender Dysphoria in Amsterdam is the largest. In contrast to international guidelines regarding HIV testing in TGW, HIV testing is not routinely performed in our center, similar to many other hospitals in Europe.[4]

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The underlying idea is that among TGW visiting academic centers for gender-confirming services in Western countries, gender incongruence is much more socially accepted and less refined to certain vulnerabilities, such as sex work, that are associated with high risk for HIV. However, data on HIV prevalence in TGW who undergo vaginoplasty are lacking. Insight into the prevalence among TGW undergoing vaginoplasty is essential for this population might differ in sexual behavior and thus might need tailored testing advice.

Public health efforts emphasize the importance of detecting and treating undiagnosed HIV as a means of reducing onward transmission of HIV,[5,6] preventing opportunistic infections and improving survival in people living with HIV.[7] Therefore, a better understanding of the prevalence of HIV and associated risk factors in TGW is important to inform both health care professionals and patients, and improve policy and intervention programs regarding transgender sexual health. The aim of this study is to obtain representative estimates of the prevalence of HIV among TGW who underwent vaginoplasty and to identify subgroups associated with living with HIV.

Materials and Methods

Study population

All TGW who underwent primary vaginoplasty at our institution between January 2000 and September 2019 were identified from a departmental database. "Primary vaginoplasty" was defined as vaginoplasty performed in TGW who did not previously undergo vaginoplasty or gender-confirming vulvoplasty (no-depth vaginoplasty), either at our or at another institution. All included TGW were 18 years of age or older and were treated according to the standards of care, as formulated by the World Professional Association for Transgender Health.[8]

Study design

A retrospective chart study was conducted, recording the following characteristics: age at vaginoplasty, region of birth (European vs. non-European), use of medication, history of injecting drug use, and history of pubertal suppression. Sexual preference was included from 2011 onward.

Data acquisition

At the first preoperative consultation at the outpatient clinic, medical history taking and preoperative physical examination were performed. The medical referral, including medical history and current medication overview, was reviewed with the patient. HIV status or use of HIV medication, either self-reported or from referral information, was assessed. Sexual preference was asked ("solely men," "solely women," "both," "none," or "unclear at this moment") as a step in the exploration of their postoperative sexual needs since 2011.

Statistical analysis

Continuous variables were presented as means with standard deviations. Descriptive analysis was performed to describe HIV prevalence and the distribution of sociodemographic characteristics and sexual preference of the participants.

We categorized sexual preference into sexual preference for men or other, because of low numbers in each category. We performed logistic regression analysis to estimate the associations (odds ratios [ORs] with 95% confidence intervals [CIs]) of independent variables (determinants) and outcome (HIV). Region of birth, intravenous drug use, and sexual preference will be used as predictors. All variables with an associated p-value < 0.2 in bivariate analysis will be included in multivariate analysis. Data analyses were performed with SPSS package v26.0 (SPSS, Chicago, IL). A p-value of < 0.05 was considered statistically significant.

Ethical approval

All participants provided informed consent to use their anonymized data for study purposes. For this study, written approval was obtained from the institutional medical ethical exam committee of the VU University Medical Center (2019.507).

Results

Participant demographics

Between January 2000 and September 2019, a total of 950 TGW underwent primary vaginoplasty surgery at our institution. The median age of TGW living with HIV was 33 years (range 18–70). The majority had not received puberty suppression treatment (829/950, 87.3%), were born in Europe (805/950, 84.7%), and had never injected drugs (912/950, 96%). A total of 31 (3.3%) TGW were living with HIV.

Of TGW born in Europe, 11 out of 805 (1.4%) were living with HIV, whereas of those born outside of Europe, 20 out of 145 (13.8%) were living with HIV. Of the 585/950 (61.6%) of TGW with a known sexual preference, 321/585 (54.9%) had a sexual preference toward men; in this group, 29/321 (9.0%) were living with

HIV, compared with 1/264 (0.4%) of those with a sexual preference toward other groups. None of the TGW living with HIV had a history of puberty suppression (Table 1). No use of HIV pre-exposure prophylaxis (PrEP) was found among TGW in this cohort.

Factors associated with living with HIV

In bivariate analysis, a region of birth outside of Europe (OR = 11.5, 95% CI 5.4–24.7) and sexual preference toward men (OR = 36.1, 95% CI 4.9–267) were associated with living with HIV (Table 2). In multivariate analysis, region of birth outside of Europe (OR = 5.9, 95% CI 2.7–13.1) and sexual preference toward men (OR = 24.9, 95% CI 3.3–186.3) remained associated with living with HIV.

Discussion

We present a study conducted in the Netherlands on the prevalence of HIV in TGW who underwent vaginoplasty. Studies on HIV prevalence among the transgender population (TGP) in western European countries are scarce. In the Netherlands, two studies reported a prevalence of 18.8–20% HIV in TGW sex workers.[9,10] In a systematic review, a pooled HIV prevalence of 19.1% (95% CI 17.4–20.7) was found in TGW worldwide.[1] Although the HIV prevalence (3.3%) in our study is lower than reported internationally among TGW, it is evidently higher than among cisgender people visiting sexual health clinics in the Netherlands (0.2%) and the general population (0.2%).[11,12]

TGW are considered a highly vulnerable group to HIV infection. Important behavioral factors that facilitate HIV transmission among TGW are engagement in condomnless anal sex with multiple sex partners, sex work, (injection) drug use before or during sex, and needle sharing during these activities.[13,14] The risk associated with condomless sex with a neovagina is less well known. Moreover, a lack of knowledge on HIV transmission, low education attainment, and limited employment options resulting in poor economic conditions could be structural factors driving individuals' engagement in sex work practices and condomless anal sex, which may also facilitate HIV transmission among TGP.

Determinants associated with living with HIV in this study mirror those reported in international studies.[5,6] Unfortunately, detailed data on sexual behavior are lacking in our study due to the retrospective nature of data acquisition. However, a large proportion of TGW living with HIV reported a sexual preference for men. This may involve, before undergoing vaginoplasty, engaging primarily in receptive anal intercourse, because of often reported difficulty maintaining an

Table 1. Demographics of the Transgender Women Undergoing Vaginoplasty Between January 2000 to September 2019 at the Center of Expertise on Gender Dysphoria in Amsterdam

	TGW (*N*=950)	
	n*/*N	**% living with HIV**
Smoking		
No	14/723	1.9
Yes	17/227	7.5
History of puberty suppression hormones		
No	31/829	3.7
Yes	0/121	0
Region of birth		
Non-European[a]	20/145	13.8
European	11/805	1.4
Sexual preference		
Men	29/321	9.0
Other[b]	1/264	0.4
Missing	1/365	0.3
History of injecting drug use		
No	30/912	3.3
Yes	1/7	14.3
PrEP use		
No	0/950	0
Yes	0/950	0

[a]Non-European individuals comprise Middle Eastern, North American, Latin American, African, and Asian individuals. HIV positivity in Latin American individuals 11 out of 72, 15.3%, in African individuals 2/10, 20%, and in Asian individuals 5/31, 16.1%.

[b]The category "other" comprises sexual preference toward women, both men and women, asexual and unknown to patients. Sexual preference was unknown for 365 patients as this variable was not collected systematically before 2011.

PrEP, pre-exposure prophylaxis; TGW, transgender women.

Table 2. Bivariate and Multivariate Determinants Associated with HIV Positivity in Transgender Women Before Undergoing Primary Vaginoplasty Between January 2000 to September 2019 at the Center of Expertise on Gender Dysphoria

	TGW (*n*=950)	
	Bivariate logistic regression	**Multivariate logistic regression**
	OR (95% CI)	**aOR (95% CI)**
History of IDU		
Yes	4.3 (0.5–36.4)	
Region of birth		
Non-European	11.5 (5.4–24.7)	5.9 (2.7–13.1)
Sexual preference		
Other	1.4 (0.1–22.2)	
Men	36.1 (4.9–267)	24.9 (3.3–186.3)

aOR, adjusted odds ratio; CI, confidence interval; IDU, injecting drug use; OR, odds ratio.

erection due to hormonal effects. In addition, receptive anal intercourse may be perceived as more feminine or gender-affirming than insertive intercourse.[13,15,16] Therefore, they might have had a higher risk of acquiring HIV.

In line with other data, being born outside of Europe is correlated with living with HIV. There is mounting evidence that acquisition of HIV infection in migrants is acquired postmigration,[17] related to the socioeconomic and structural inequalities they face postmigration,[18] and different sexual behaviors in a new environment.[19]

Remarkably, none of the individuals living with HIV in our study had a history of using puberty suppression. Research suggests that parental acceptance and social support may serve transgender adolescents to access the gender-affirming treatment they desire in a timely manner and also serve as a protective factor against HIV.[20] Transgender adolescents with a history of puberty suppression are characterized as being sexually less experienced than the cisgender adolescents and this behavior might continue into adulthood.[21,22] Body and especially genital aversion, a key element of gender dysphoria, are strongly present in transgender adolescents and might be the reason why most transgender adolescents avoid sexual practices before vaginoplasty.[23,24]

Of transgender individuals with an early onset of feelings of gender dysphoria who reported to be sexually active, 50% stated that sexual contact did not involve their genitals.[25] Furthermore, known side effects of puberty suppression are loss of sexual desire and loss of the quality of the erection. This could be reasons for the lower proportion of persons living with HIV and diagnosed who received puberty suppression. However, one might suspect that after genital gender affirming surgery (gGAS), a sexual turning point such as intercourse will follow, since gender dysphoria will be alleviated.[26] More research into HIV incidence after gGAS for TGW could provide insight into HIV testing needs for this specific group.

Strengths and limitations

Strengths of this study comprise the high number of included TGW. Our center is the primary transgender (surgical) care center of our country, making it ideally suitable for this type of data acquisition. Furthermore, sex work and injecting drug use are legally tolerated in the Netherlands, thus TGW would be less likely to withhold information in clinical context to receive gGAS. Therefore, the data might be true to the patients' lived experience.

Weaknesses of this study comprise the method of determining HIV diagnosis: by self-report and referral information, medication, and chart review. Therefore, some of the included patients in this study might not be aware of their HIV infection and the reported HIV prevalence might be an under-representation of the true prevalence. Second, due to the retrospective nature of the study, detailed data on sexual behavior are lacking. For instance, reported sexual preference does not distinguish between sexual orientation and partner selection. Additional information on sexual behavior might be contributing to understanding factors associated with an HIV diagnosis in this population.

In addition, data on mental health and history of sexually transmitted infections were lacking. Last, our study population may not be representative of the wider TGW population, as all participants in our study had access to vaginoplasty, rarely reported injecting drug use, and no one was using PrEP. However, the latter may be due to the fact that PrEP was not formally available outside study settings in the Netherlands until 2019.

Clinical translation

The Dutch National Institute for Public Health and the Environment (RIVM [in Dutch]) recommends regular HIV testing in populations at high risk for HIV, including men who have sex with men (MSM) and sex workers.[27] However, no national guideline exists for routine HIV screening in the broad TGP in the Netherlands. If we want to get to zero new HIV infections, all those at risk for HIV need to have access to HIV testing.[28] In case a TGP who reports for surgery has an elevated risk on HIV, health care providers may consider counseling on HIV testing and prevention opportunities, testing for HIV pre- or postoperatively, and if HIV negative, refer for assessment of need for PrEP. A further prospective study, which is now ongoing, will provide input for changing the testing policy in our and other institutions.

Conclusions

The HIV prevalence in TGW undergoing vaginoplasty is evidently higher than in the cisgender population, however, lower than reported in global data. Preoperative as well as postoperative HIV counseling and testing of TGW undergoing vaginoplasty should be

considered. However, future prospective studies should investigate the need and feasibility of routine HIV testing of TGW visiting gender dysphoria expertise centers.

Authors' Contributions

W.B.v.d.S. and C.G.D. designed the study protocol and performed statistical analysis. Results were thoroughly discussed by C.G.D., E.H., M.d.H., B.P.C.K., and W.B.v.d.S. C.G.D. drafted the article, all authors commented on draft versions, and all approved the final version.

Author Disclosure Statement

The authors declare that they have no conflict of interest.

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References

1. Baral SD, Poteat T, Stromdahl S, et al. Worldwide burden of HIV in transgender women: a systematic review and meta-analysis. Lancet Infect Dis. 2013;13:214–222.
2. McNulty A, Bourne C. Transgender HIV and sexually transmissible infections. Sex Health. 2017;14:451–455.
3. Benotsch EG, Zimmerman RS, Cathers L, et al. Non-medical use of prescription drugs and HIV risk behaviour in transgender women in the Mid-Atlantic region of the United States. Int J STD AIDS. 2016;27:776–782.
4. Transgender people and HIV. Policy brief. July 2015. Available at: https://apps.who.int/iris/bitstream/handle/10665/179517/WHO_HIV_2015.17_eng.pdf;jsessionid=5798495D63FBD0FC0DB6147A845BFA52?sequence=1 Accessed December 20, 2021.
5. Poteat T, German D, Flynn C. The conflation of gender and sex: gaps and opportunities in HIV data among transgender women and MSM. Global Public Health. 2016;11:835–848.
6. Poteat T, Scheim A, Xavier J, et al. Global epidemiology of HIV infection and related syndemics affecting transgender people. J AIDS (1999). 2016;72(Suppl. 3):S210–S219.
7. HIV/AIDS treatment and care: WHO. 2020. Available at: https://www.who.int/health-topics/hiv-aids#tab=tab_3 Accessed December 20, 2021.
8. Coleman E, Bockting WO, Botzer M, et al. Standards of care for the health of transsexual, transgender, and gender-nonconforming people, version 7. Int J Transgend. 2012;13:165–232.
9. Druckler S, van Rooijen MS, de Vries HJC. Substance use and sexual risk behavior among male and transgender women sex workers at the prostitution outreach center in Amsterdam, the Netherlands. Sex Transm Dis. 2020;47:114–121.
10. van Veen MG, Gotz HM, van Leeuwen PA, et al. HIV and sexual risk behavior among commercial sex workers in the Netherlands. Arch Sex Behav. 2010;39:714–723.
11. Jaarcijfers 2020 Soa polikliniek. GGD Amsterdam. 2020. Available at: https://www.ggd.amsterdam.nl/ggd/publicaties/jaarverslagen/ Accessed December 20, 2021.
12. The World Bank. Prevalence of HIV, total (% of population ages 15–49)—Netherlands. 2020. Available at: https://data.worldbank.org/indicator/SH.DYN.AIDS.ZS?locations=NL Accessed December 20, 2021.
13. Clements-Nolle K, Marx R, Guzman R, Katz M. HIV prevalence, risk behaviors, health care use, and mental health status of transgender persons: implications for public health intervention. Am J Public Health. 2001;91:915–921.
14. De Santis JP. HIV infection risk factors among male-to-female transgender persons: a review of the literature. J Assoc Nurses AIDS Care. 2009;20:362–372.
15. Nemoto T, Bodeker B, Iwamoto M, Sakata M. Practices of receptive and insertive anal sex among transgender women in relation to partner types, sociocultural factors, and background variables. AIDS Care. 2014;26:434–440.
16. Reback CJ, Clark K, Holloway IW, Fletcher JB. Health disparities, risk behaviors and healthcare utilization among transgender women in Los Angeles County: A comparison from 1998–1999 to 2015–2016. AIDS Behav. 2018;22:2524–2533.
17. Fakoya I, Alvarez-del Arco D, Woode-Owusu M, et al. A systematic review of post-migration acquisition of HIV among migrants from countries with generalised HIV epidemics living in Europe: implications for effectively managing HIV prevention programmes and policy. BMC Public Health. 2015;15:561.
18. Deblonde J, Sasse A, Del Amo J, et al. Restricted access to antiretroviral treatment for undocumented migrants: a bottle neck to control the HIV epidemic in the EU/EEA. BMC Public Health. 2015;15:1228.
19. Mole RC, Parutis V, Gerry CJ, Burns FM. The impact of migration on the sexual health, behaviours and attitudes of Central and East European gay/bisexual men in London. Ethn Health. 2014;19:86–99.
20. Le V, Arayasirikul S, Chen YH, et al. Types of social support and parental acceptance among transfemale youth and their impact on mental health, sexual debut, history of sex work and condomless anal intercourse. J Int AIDS Soc. 2016;19(Suppl. 2):20781.
21. Bungener SL, Steensma TD, Cohen-Kettenis PT, de Vries ALC. Sexual and romantic experiences of transgender youth before gender-affirmative treatment. Pediatrics. 2017;139:e20162283.
22. Bouman MB, van der Sluis WB, van Woudenberg Hamstra LE, et al. Patient-reported esthetic and functional outcomes of primary total laparoscopic intestinal vaginoplasty in transgender women with penoscrotal hypoplasia. J Sex Med. 2016;13:1438–1444.
23. Cohen-Kettenis PT, Schagen SE, Steensma TD, et al. Puberty suppression in a gender-dysphoric adolescent: a 22-year follow-up. Arch Sex Behav. 2011;40:843–847.
24. Doorduin T, van Berlo W. Trans people's experience of sexuality in the Netherlands: a pilot study. J Homosex. 2014;61:654–672.
25. Cerwenka S, Nieder TO, Cohen-Kettenis P, et al. Sexual behavior of gender-dysphoric individuals before gender-confirming interventions: a European multicenter study. J Sex Marital Ther. 2014;40:457–471.
26. de Vries AL, McGuire JK, Steensma TD, et al. Young adult psychological outcome after puberty suppression and gender reassignment. Pediatrics. 2014;134:696–704.
27. Sexually transmitted infections in the Netherlands in 2018: National Institute of Public Health and the Environment. 2019. Available at: https://www.rivm.nl/bibliotheek/rapporten/2019-0007.pdf Accessed December 20, 2021.
28. UNAIDS. On the fast track to end AIDS. 2016–2021 Strategy. Available at: https://www.unaids.org/sites/default/files/media_asset/20151027_UNAIDS_PCB37_15_18_EN_rev1.pdf Accessed December 20, 2021.

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Abbreviations Used

aOR = adjusted odds ratio
CI = confidence interval
OR = odds ratio
PrEP = pre-exposure prophylaxis
TGP = transgender population
TGW = transgender women